PLANT THERAPY
100% PURE ESSENTIAL OILS

GC/MS BATCH NUMBER: G40103

ESSENTIAL OIL: GINGER ROOT CO2
BOTANICAL NAME: ZINGIBER OFFICINALE
ORIGIN: GERMANY

KEY CONSTITUENTS PRESENT IN THIS BATCH OF GINGER ROOT CO2 OIL	%
[6]-GINGEROL	14.6
ZINGERONE	9.0
[10]-SHOGAOL	7.6
[6]-SHOGAOL	7.2
α-ZINGIBERENE	6.2
[8]-GINGEROL	4.4
[8]-SHOGAOL	3.8
DECANAL	3.2
β-SESQUIPHELLANDRENE	2.5
[11]-PARADOL	2.3
δ-CADINENE	1.4
ar-CURCUMENE	1.3
(E,E)-α-FARNESENE	1.2
1-DEHYDRO-[10]GINGERDIONE	1.2
[13]-PARADOL	1.1

Comments from Robert Tisserand: A rich and spicy odor profile. This CO2 extract has 20% total gingerols and 20% total shogaols, important constituents that are not found in Ginger distilled oils.

Date : June 15, 2016

SAMPLE IDENTIFICATION

Internal code : 16F08-PTH6-1-SM
Customer identification : Ginger Root CO2 - G4010355
Type : Essential oil
Source : *Zingiber officinale*
Customer : Plant Therapy

ANALYSIS

Method : PC-PA-001-15E06, "Analysis of the composition of a liquid essential oil by GC-FID" (in French).
Analyst : Sylvain Mercier, M. Sc., chimiste
Analysis date : 2016-06-15

Checked and approved by :

Alexis St-Gelais, M. Sc., chimiste 2013-174

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IDENTIFIED COMPOUNDS

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
2,4-Pentadienal?	2.13	840	1.68	1.29	1090	1.81	Aliphatic aldehyde
Tricyclene	3.18	919	0.03	0.01	935	0.84	Monoterpene
α-Pinene	3.35	929	0.15	0.19	955	0.92	Monoterpene
Camphene	3.64	947	0.48	0.64	1009	1.16	Monoterpene
Sabinene	4.07	973	0.01	0.01	1064	1.61	Monoterpene
β-Pinene	4.13	976	0.02	0.02	1047	1.47	Monoterpene
Myrcene	4.41	993	0.08	0.23	1116	2.04*	Monoterpene
α-Phellandrene	4.68	1009	0.03	[0.23]	1116	2.04*	Monoterpene
α-Terpinene	4.95	1024	0.59	0.60	1122	2.12	Monoterpene
Limonene	5.09	1032	0.19	0.18	1147	2.41	Monoterpene
β-Phellandrene	5.12	1034	0.53	1.12	1153	2.49*	Monoterpene
1,8-Cineole	5.16	1036	0.42	[1.12]	1153	2.49*	Monoterp. ether
Terpinolene	6.11	1088	0.02	0.03	1231	3.45	Monoterpene
Linalool	6.67	1114	0.13	0.16	1504	7.77	Monoterp. alcohol
Camphor	7.66	1151	0.01	0.01	1424	6.26	Monoterp. ketone
Borneol	8.61	1186	0.20	0.46	1626	11.49*	Monoterp. alcohol
α-Terpineol	9.38	1210	0.11	0.57	1632	11.77*	Monoterp. alcohol
Decanal	9.76	1219	3.17	4.05	1454	6.82	Aliphatic aldehyde
Neral	11.02	1247	0.26	0.49	1608	10.83	Monoterp. aldehyde
Geraniol	11.96	1268	0.11	0.15	1789	19.77	Monoterp. alcohol
Geranial	12.54	1281	0.44	0.70	1657	12.84	Monoterp. aldehyde
Bornyl acetate	12.75	1286	0.02	0.02	1515	8.00	Monoterp. ester
2-Undecanone	13.68	1305	0.13	0.16	1550	9.05	Aliphatic ketone
α-Copaene	17.34	1363	0.08	0.08	1431	6.37	Sesquiterpene
β-Elemene	18.58	1382	0.08	0.07	1520	8.14*	Sesquiterpene
Geranyl acetate	19.16	1390	0.07	0.06	1696	14.66	Monoterp. ester
β-Caryophyllene	20.20	1406	0.03	[0.07]	1520	8.14*	Sesquiterpene
trans-α-Bergamotene	21.48	1421	0.17	0.15	1536	8.63	Sesquiterpene
9-epi-β-Caryophyllene	23.68	1448	0.05	1.52	1675	13.69*	Sesquiterpene
trans-β-Farnesene	24.17	1454	0.10	[0.46]	1626	11.49*	Sesquiterpene
Germacrene D	25.18	1466	0.33	[0.57]	1632	11.77*	Sesquiterpene
β-Selinene	25.75	1473	0.08	[0.57]	1632	11.77*	Sesquiterpene
ar-Curcumene	26.31	1480	1.31	7.01	1713	15.38*	Sesquiterpene
α-Selinene	26.61	1483	0.52	1.14	1641	12.16	Sesquiterpene
α-Zingiberene	27.76	1497	6.17	9.27	1672	13.55*	Sesquiterpene
γ-Cadinene	28.06	1501	0.09	[9.27]	1672	13.55*	Sesquiterpene
(*E*,*E*)-α-Farnesene	28.58	1508	1.18	[7.01]	1713	15.38*	Sesquiterpene
δ-Cadinene	28.89	1512	1.41	[1.52]	1675	13.69*	Sesquiterpene
trans-γ-Bisabolene	28.99	1513	0.05	0.09	1687	14.23	Sesquiterpene
β-Sesquiphellandrene	30.01	1527	2.51	[7.01]	1713	15.38*	Sesquiterpene
α-Elemol	31.61	1549	0.10	0.07	2004	33.80	Sesquiterp. alcohol

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cis-Sesquisabinene hydrate	32.94	1567	0.04				Sesquiterp. alcohol
trans-Sesquisabinene hydrate	35.16	1598	0.10				Sesquiterp. alcohol
(*cis*?)-Zingiberenol	36.34	1622	0.16	0.19	1998	33.41	Sesquiterp. alcohol
(*trans*?)-Zingiberenol	37.24	1644	0.09	0.10	2016	34.47	Sesquiterp. alcohol
β-Eudesmol	37.70	1655	0.14	0.13	2111	38.03	Sesquiterp. alcohol
Zingerone	39.02	1687	9.01	13.16	2670	50.47	Phenylbutanoid
Linoleic acid	52.25	2187	0.41	0.28	3098	57.70	Fatty acid
Stearic acid	52.85	2215	0.24	0.19	3078	57.40	Fatty acid
[6]-Shogaol	55.29	2334	7.24	8.99	3381	62.00	Gingerol derivative
[7]-Paradol	55.81	2360	0.15	0.32	3251	60.08	Gingerol derivative
[6]-Gingerol	57.55	2449	14.63				Gingerol derivative
Methyl [6]-gingerol	57.70	2457	0.51				Gingerol derivative
[8]-Shogaol	59.32*	2543	3.78	4.00	3599	65.12	Gingerol derivative
[9]-Paradol	59.32*	2543	[3.78]	0.93	3472	63.33	Gingerol derivative
Diacetoxy-[6]-gingerdiol	59.80	2569	0.75				Gingerol derivative
[8]-Gingerol	61.35	2655	4.38				Gingerol derivative
[10]-Shogaol	63.25	2764	7.63	7.07	3834	68.28	Gingerol derivative
[11]-Paradol	63.71	2791	2.29				Gingerol derivative
[10]-Gingerol	64.39	2831	0.48				Gingerol derivative
1-Dehydro-[8]-gingerdione	66.32	2949	0.14				Gingerol derivative
[12]-Shogaol	66.59	2965	0.38				Gingerol derivative
[13]-Paradol	68.42	3082	1.06	1.08	3843	68.41	Gingerol derivative
1-Dehydro-[10]-gingerdione	69.11	3127	1.20				Gingerol derivative
[15]-Paradol	70.16	3197	0.30	0.52	4043	70.97	Gingerol derivative
1-Dehydro-[12]-gingerdione	72.26	3331	0.16				Gingerol derivative
Total identified			**78.41%**	**67.51%**			

*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, not taken account in the identified total

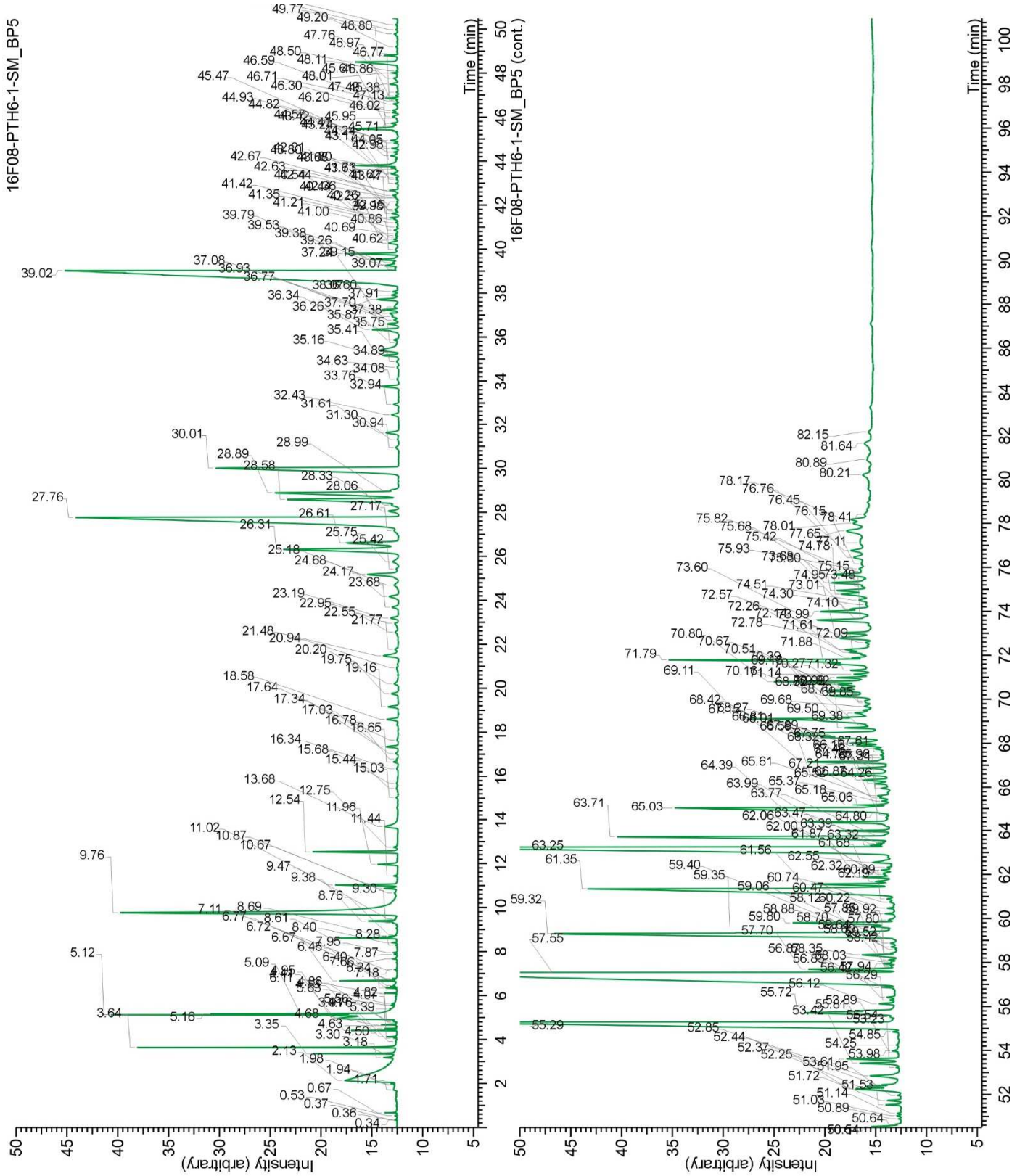
Note: no correction factor was applied

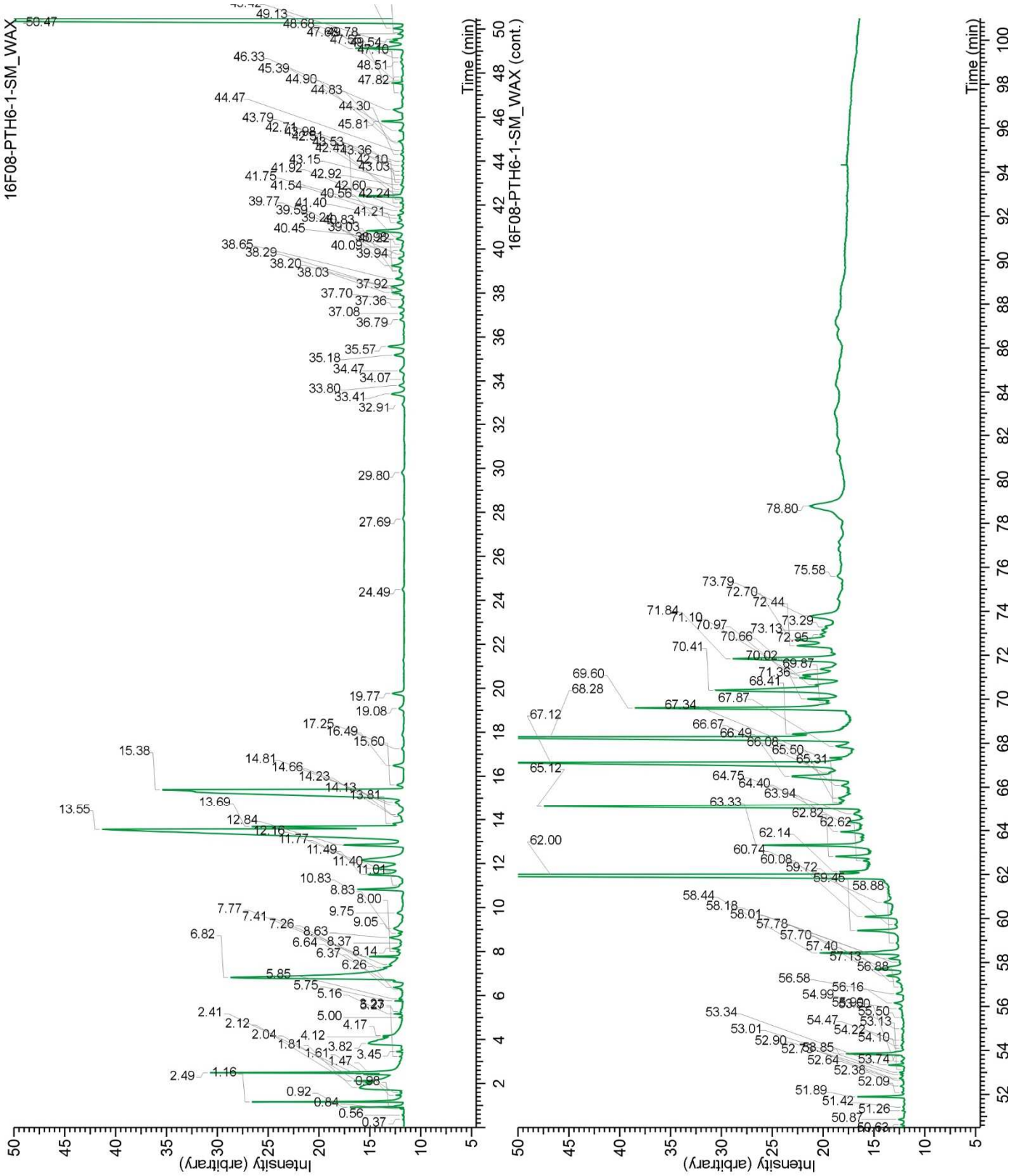
Other Data

Physical aspect : Orange-brown liquid
Refractive index : 1.5060 ± 0.0003 (20 °C)

Conclusion

No adulterant, contaminant or diluent were detected using this method.


16F08-PTH6-1-SM_BP5
Time (min)
Intensity (arbitrary)
16F08-PTH6-1-SM_BP5 (cont.)
Time (min)
Intensity (arbitrary)



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